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Butterfly diversity of Lička Plješevica Mountain chain, Croatia (Lepidoptera: Papilionoidea)

T. Koren, B. Lauš, N. Tvrtković & R. Verovnik

Abstract

Lička Plješevica is an elongated mountain massif situated in the Croatian Lika region, at the border with Bosnia and Herzegovina. It was never a target of any systematic butterfly surveys, and its butterfly fauna was poorly studied. During our surveys from 2007 to 2019, we recorded 142 butterfly species on 71 localities. Along with the records from the available literature, a total of 152 species were recorded from Lička Plješevica massif. This is the second most diverse butterfly fauna of a mountain chain in Croatia, lagging just behind Velebit Mts. with 153 species. Faunal composition of both mountain chains is however similar with exception of montane species which are less numerous on Lička Plješevica. For some species with scarce records from Croatia like: *Colias caucasica*, *Cupido osiris*, *Eumedonia eumedon*, *Plebejus argyrognom*, *Thecla betulae*, *Melitaea britomartis*, *Araschnia levana* and *Neptis rivularis* new records are discussed. Abandonment and subsequent overgrowing has been recognized as the most important factor potentially causing long term butterfly declines in the region.

KEY WORDS: Lepidoptera, Papilionoidea, distribution, diversity, conservation, Croatia.

Diversidad de las mariposas de la cadena montañosa de Lička Plješevica, Croacia (Lepidoptera: Papilionoidea)

Resumen

Lička Plješevica es un alargado macizo montañoso situado en la región croata de Lika, en la frontera con Bosnia y Herzegovina. No fue una meta, de ninguna investigación sistemática de las mariposas y su fauna está pobremente estudiada. Durante nuestras inspecciones de 2007 a 2019, registramos 142 especies de mariposas de 71 localidades. Al mismo tiempo con los datos disponibles en la literatura, se registró un total de 152 especies localizadas en el macizo de Lička Plješevica. Esta es la segunda fauna más diversa de mariposas de una cadena de montaña en Croacia, detrás de la montaña de Velebit con 153 especies. No obstante, la composición de la fauna de ambas cadenas montañosas es similar, con, más o menos, la excepción de las especies de las montañas de Lička Plješevica. Se discuten nuevas localidades de algunas especies con escasos registros en Croacia: *Colias caucasica*, *Cupido osiris*, *Eumedonia eumedon*, *Plebejus argyrognom*, *Thecla betulae*, *Melitaea britomartis*, *Araschnia levana* y *Neptis rivularis*. El abandono y la sobreexplotación han sido reconocidos como los factores potenciales más importantes de la causa, a largo plazo, de la disminución de las mariposas en la región.

PALABRAS CLAVE: Lepidoptera, Papilionoidea, distribución, diversidad, conservación, Croacia.

Introduction

Lička Plješevica massif is an elongated mountain chain that extends more than 100 kilometres in the northwest-southeast direction from Medveđak and Velika Plješevica in the north-eastern part of Croatian Lika region, through Mala Plješevica, Ozeblin peak, and complex of several lower mountains

like Kremen, Mazinske planine and Urljaj in the south-eastern part of the chain. Isolated peaks Lisac east of Gračac and Mt. Poštak northwest of Knin are also considered as part of the massif (HORVAT, 1925; POLJAK, 1974). The whole range runs in parallel but further inland to Velebit Mts. while the southern part including Mt. Poštak is inserted between Velebit and Dinara Mountain chains. The north-western border, right side of Upper Korana Gorge, Medveđak Hill, Donja Jezera, right bank of Kozjak Lake and Prijeboj are situated in National Park Plitvice Lakes. The western slopes of Lička Plješevica massif rise from the several karst poljes in Lika region: Koreničko polje, Bjelopolje, Krbavsko polje and Gračačko polje, while its eastern slopes descend into the gorges of upper Una River, Srebrenica and Butižnica which represent the natural boundary between Croatia and Bosnia and Herzegovina. Within Lička Plješevica range there are several small valleys and two karst poljes, the Lapačko polje and Gubavčevo polje. The highest peaks of the mountain chain are located in the northern part of the massif, Ozeblin (1657 m a.s.l.) and Gola Plješevica (1647 m a.s.l.) where the subalpine altitudinal belt with dwarf pine (*Pinus mugo* Turro) and alpine meadows is developed near the peaks above 1600 m a.s.l. (HORVAT, 1925). About 85 % of northern part of Mt. Lička Plješevica is covered with dense forests mostly of Euro-Siberian forest belt, with only small remnants of alpine and montane grasslands and pastures, usually in the upper parts of the mountains (POLJAK, 1998). Open dry calcareous grasslands and pastures in different stages of abandonment characterised by the presence of some typical sub-Mediterranean plants are still abundant in the central and southern part of the massif at lower elevations (TRINAJSTIĆ & ŠUGAR, 1968; ŠUGAR & PLAZIBAT, 1988).

The entire region has a very complex geological structure composed of diverse rocks, mostly of carbonate and dolomite originating from the Mesozoic period (the main ridge of Gola Plješevica is from Cretaceous carbonate and dolomite), but with incorporated mosaic of other types of rocks like Triassic siltstones and micaceous sandstones between Glogovo and Lisac hill (ANONYMUS, 1978: Geological map SFRJ 1:500000). The Lička Plješevica massif is located in continental region with strong influence of Mediterranean climate which penetrates deep into continent along Butižnica Valley and Una River Gorge, and along karst poljes west of the mountain chain (TRINAJSTIĆ & ŠUGAR, 1968). The average temperature in January is -4,5°C and in July between 12°C and 14°C (BOGNAR *et al.*, 1975).

The historical data about the butterfly fauna of Lička Plješevica chain are relatively few and scattered across a wide time frame. First record was published by Gjuro Koča (KOČA, 1901) who reported *Erebia ligea* (Linnaeus, 1758) in 1891, and the German malacologist Rudolf Sturany who collected *Spialia sertorius* (Hoffmansegg, 1804) (possibly *S. orbifer* (Hübner, [1823])), *Vanessa atalanta* (Linnaeus, 1758), *Euphydras aurinia* (Rottemburg, 1775), *Melitaea aurelia* Nickerl, 1850, *M. didyma* (Esper, 1778), *Boloria euphrosyne* (Linnaeus, 1758), and *Cupido minimus* (Fuessly, 1775) in the foothills of Velika Lička Plješevica near Plitvice Lakes (REBEL, 1895). Additionally, Hochetlinger noted *Parnassius mnemosyne* (Linnaeus, 1758) as “common species around touristic house below Plješevica peak” (Gola Plješevica), together with records of three rare species in the region *Apatura ilia* ([Denis & Schiffermüller], 1775), *Limenitis populi* (Linnaeus, 1758), and probably regionally extinct *Nymphalis vaualbum* ([Denis & Schiffermüller], 1775) which he also observed near Plitvice Lakes (FRANIĆ, 1910).

In last week of July to 2nd August 1922, students from Zagreb University Zdravko Lorković and Zvonimir Badovinac collected butterflies from Zrmanja River spring (LORKOVIĆ, 1974), near Dabašnica (LORKOVIĆ, 1989), on Ozeblin peak, in vicinity of forest hut near Karlović Korita, from alpine meadow Ruda Poljana on Mala Plješevica Mountain (MLADINOV & LORKOVIĆ, 1979), and near Plitvice Lakes. Based on this collection STEINER (1938) published unexpected finding of a new butterfly species for the fauna of Croatia *Boloria titania* (Esper, 1793) from “Lička Plješevica”. The record was later confirmed by MLADINOV & LORKOVIĆ (1985) based on observations of Badovinac from Ruda Poljana, 1616 m a.s.l. Another 43 species observed in the area were noted in Lorković’s manuscript from 1954, which was published only recently after he passed away (LORKOVIĆ, 2009). Lorković also added his observation of *Hipparchia statilinus* (Hufnagel, 1766) from Zrmanja River spring (LORKOVIĆ, 1974), first record of *Pieris balcana* Lorković, 1969 near Dabašnica and after chromosome analysis also confirmed the contact zone between *P. napi* (Linnaeus,

1758) and *P. balcana* Lorković, 1969 at Plitvice Lakes (LORKOVIĆ, 1970, 1989). MLADINOV (1973) added records for eight additional species originating from the area, stored in the collection of Natural History Museum in Zagreb. MLADINOV & LORKOVIĆ (1979) additionally included a montane species *Erebia oeme* (Hübner, [1804]).

Recently, KOREN (2010) published first findings of *Polyommatus ripartii* (Freyer, 1830), and KOREN *et al.* (2010) the observations of *Proterebia phegea* (Borkhausen, 1788) both from the Zrmanja spring area. KOREN *et al.* (2011) and KOREN *et al.* (2015) reviewed rich butterfly fauna of Zrmanja River source and Mt. Poštak (92 and 108 recorded species respectively). KOREN & ŠTIH (2013) noted *Melitaea ornata* Christoph, 1893 from Zrmanja spring area, and TVRTKOVIĆ *et al.* (2015) added some interesting species records from Lisac peak, Kremen Mt. and Una Gorge including *Euphydryas maturna* (Linnaeus, 1758). Taxonomical status and occurrence of species of the *Polyommatus* subgenus *Agrodiaetus* in this region was also recently discussed (KOREN & LAUŠ, 2015; LOVRENČIĆ *et al.*, 2016).

The goal of this contribution is to present the overview of the butterfly diversity of the Lička Plješevica massif based on the recent faunistic surveys of the authors (2007 - 2019), with explanatory notes for some rare and interesting species recorded in the area. A comparison with neighbouring Velebit and Dinara Mountain chains is discussed in terms of diversity and zoogeography. We also discuss the main threats that could on a long run cause the decline of the high butterfly diversity in the region.

Materials and methods

Field surveys specifically addressing the butterfly fauna of the region were carried out mostly during the last five years, from 2014 onwards. Topography and habitat diversity were used to select the best suitable localities in the region. A total of 71 localities were visited during the surveys, some of them with butterfly rich habitats were visited on several occasions (Figure 1). The spatial processing and visualisation of data was made in the program ARC GIS desktop. Butterflies were identified using standard field guides (LAFRANCHIS, 2004; TOLMAN & LEWINGTON, 2008). Additionally, specimens of the genera *Leptidea*, *Melitaea* and *Plebejus* were collected and their genitalia were examined for correct identification. Revision of collected specimens from *Pieris napi* / *balcana* aggregate were examined with help of wing-markings (LORKOVIĆ, 1970). The nomenclature follows WIEMERS *et al.* (2018). The biogeographical affiliation adheres to KUDRNA *et al.* (2016).

List of localities

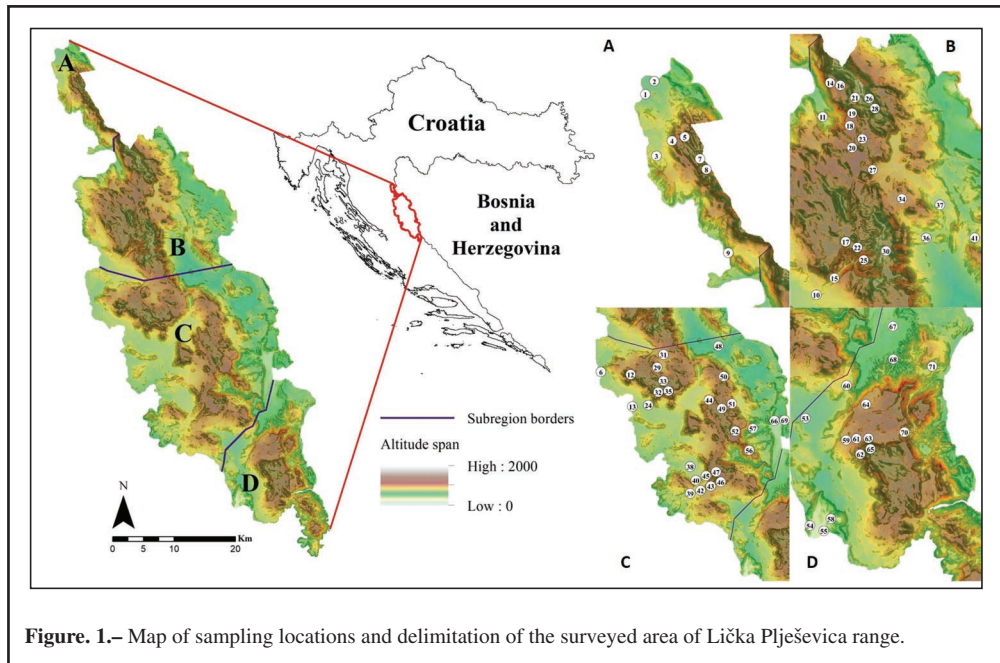
The list of localities contains the relevant toponyms, a short description of the habitat, altitude, coordinates, dates of the visits and observers. Localities are mostly arranged in geographical order from northwest towards southeast (Fig. 1).

1. Prijeboj, meadows toward Ličko Petrovo Selo, N: 44,846625, E: 15,682131, 661 m, 2-VIII-2015, BL, MZ
2. Medveđak Hill, N of Prijeboj settlement, spring Dražica, forest edge, grasslands, N: 44,856174, E: 15,691113, 672 m, 28-VI-2015, TK
3. Velika Plješevica, N of Korenica, meadows between Krgin vršak and Jukanova draga, bushy meadow surrounded by forest, N: 44,801503, E: 15,694054, 773 m, 25-VII-2015, BL, MZ
4. Velika Plješevica, N of Korenica, Stare paljevine, forest edge, N: 44,812725, E: 15,709914, 982 m, 25-VII-2015, BL, MZ
5. Velika Plješevica, N of Korenica, between Jarača and Torovi, forest edge, small patches of grasslands, N: 44,815631, E: 15,722884, 1015 m, 25-VII-2015, BL, MZ, 21-V-2016, TK, MZ
6. Udbina, Kurjak, small hill with a transmitter near the turn for the village, dry grasslands, abandoned quarry, N: 44,486958, E: 15,732503, 775 m, 13-VIII-2016, RV, 6-VIII-2019, RV
7. Velika Plješevica, Osinjak, toward the peak Gola Plješevica, forest edge, N: 44,799754, E: 15,738640, 1365 m, 1-VIII-2007, NT, MV; 25-VII-2015, BL, MZ

8. Velika Plješevica, Gola Plješevica, grasslands and forest edge near the peak, N: 44,791911, E: 15,745421, 1455 m, 1-VIII-2007, NT, MV, 25-VII-2015, BL, MZ, 21-V-2016, TK, MZ
9. Mala Plješevica, Ponor Korenički, banks of Matica River, grasslands, forest edge, N: 44,728688, E: 15,763533, 712 m, 29-VII-2015, TK
10. Ozeblin, Kozja Draga, slopes at the entrance to the valley NE of Danilovac hamlet, overgrown grasslands, forest edge, N: 44,546395, E: 15,810098, 818 m, 21-V-2016, TK, MZ
11. Ozeblin, Frkašić, surroundings of pond Jezero, forest edge and grasslands, N: 44,676879, E: 15,815090, 840 m, 29-VI-2015, TK
12. Mt. Kremen: Ondić settlement, slopes above peak Rteševo, grasslands, forest edge, N: 44,483984, E: 15,821597, 1359 m, 23-VII-2014, BL
13. Lička Plješevica, area between Ondić and Rudopolje, overgrown dry grasslands, N: 44,437113, E: 15,825760, 735 m, 25-VI-2014, BL
14. Mala Plješevica, E of Frkašić, Škorina poljana, dry grasslands, N: 44,701803, E: 15,826848, 1204 m, 24-VII-2015, BL, MZ
15. Udbina, middle part of the Kozja draga Valley, rocky meadows along the road, N: 44,558682, E: 15,828372, 884 m, 2-VIII-2014, BL, 1-VI-2015, TK, 29-VII-2015, TK, 21-V-2016, TK, MZ, 13-VIII-2016, RV, 6-VIII-2019, RV
16. Mala Plješevica, Frkašić, Đevina uvala, meadows, N: 44,699963, E: 15,832812, 1168 m, 24-VII-2015, BL, MZ, 3-VII-2018, TK, BL, MZ
17. Lička Plješevica, NE of Vučja poljana, grasslands at the forest edge, N: 44,585483, E: 15,839517, 1292 m, 2-VIII-2014, BL
18. Mala Plješevica, road Korenica - Doni Lapac, turning toward Bijeli potoci village, *Fagus* forest, N: 44,670477, E: 15,842894, 1067 m, 24-VII-2015, BL, MZ
19. Mala Plješevica, Bijeli potoci, Poljane meadows, forest edge, N: 44,679578, E: 15,845102, 1294 m, 3-VI-2015, NT, LL, 29-VI-2015, TK, 7-VII-2015, NT, 16-IX-2015, NT, 21-V-2016, TK, MZ, 2-VII-2018, TK, 12-VII-2018, TK
20. Lička Plješevica, SE of Frkašić, meadows Unjka, dry grasslands, forest edge, N: 44,654388, E: 15,845329, 1129 m, 23-VII-2015, BL, MZ
21. Lička Plješevica, W of Ruda Polja, forest path with flowering patches, N: 44,691139, E: 15,848, 1294 m, 3-VII-2018, TK, BL, MZ
22. Lička Plješevica, E of peak Trla, forest glade, N: 44,581353, E: 15,851600, 1291 m, 2-VIII-2014, BL
23. Mala Plješevica, SE of Frkašić, old quarry NW of hill Šišinov tavan, forest clearing, N: 44,660843, E: 15,855764, 1165 m, 23-VII-2015, BL, MZ
24. Rudopolje Bruvanjsko, area of Gornja Klapavica, dry grassland, N: 44,439344, E: 15,858142, 746 m, 26-VII-2014, BL
25. Lička Plješevica, Trlska draga, partially overgrown forest edge, N: 44,572187, E: 15,858182, 1206 m, 2-VIII-2014, NT
26. Lička Plješevica, E of Frkašić, Ruda Polja meadows, overgrown grasslands, forest edge, N: 44,687917, E: 15,862389, 1294 m, 3-VII-2018, TK, BL, MZ
27. Lička Plješevica, Donji Lapac, hill Pogledalo, meadow Veliko Kamensko, grasslands, forest edge, N: 44,638324, E: 15,866548, 1051 m, 23-VII-2015, BL, MZ
28. Lička Plješevica, Debeli Vrh, grasslands, N: 44,683239, E: 15,868475, 1294 m, 3-VII-2018, TK, BL, MZ
29. Mt. Kremen, meadow Sarajevo, overgrown grasslands, N: 44,494742, E: 15,875780, 982 m, 22-VII-2014, BL
30. Lika, Plješevica, Ozeblin, Trl peak, small forest glade, forest edge, N: 44,578888, E: 15,880833, 1536 m, 22-V-2016, TK
31. Mt. Kremen, Međugorje, Magarčev do, karstic grasslands, N: 44,513609, E: 15,888295, 1072 m, 4-VI-2015, NT, LL, 8-VII-2015, NT, LL, 23-IX-2015, NT, LL
32. Mt. Kremen, large abandoned meadow S of the main ridge, overgrown grasslands, N: 44,459733, E: 15,888683, 1330 m, 1-VII-2015, RV
33. Mt. Kremen, along the ridge above the tree line, montane grasslands, rocky slopes, N: 44,463333, E: 15,889583, 1500 m, 1-VII-2015, RV
34. Lička Plješevica, Donji Lapac, meadow Malo Kamensko, grasslands, N: 44,617204, E: 15,896684, 1007 m, 1-VIII-2014, BL, 18-V-2017, MZ, 19-V-2017, MZ, 29-VI-2017, MZ
35. Gračac, Mt. Kremen, near the road SE of the peak, dry grassland, forest edge, N: 44,460183, E: 15,8989, 1160 m, 1-VII-2015, RV, 14-VII-2015, NT
36. Donji Lapac, Dnopolje, grasslands around a pond, N: 44,588682, E: 15,921794, 777 m, 29-VI-2015, TK

37. Mala Plješevica, Kalinovača, cca 7km N/NW of Donji Lapac, overgrown grassland, N: 44,612924, E: 15,935532, 758 m, 30-VII-2014, BL
38. Gubavčevo polje, NE part, dry grassland, N: 44,349671, E: 15,944296, 757 m, 27-VI-2014, BL
39. Lička Plješevica, Glogovo, Cvijetkovići, overgrown grasslands, N: 44,310367, E: 15,944637, 845 m, 19-V-2015, NT
40. Mt. Lisac, in the valley NE of the village towards Surle, partially overgrown meadows, N: 44,320513, E: 15,967480, 870 m, 26-VI-2014, BL, 26-VI-2017, RV
41. Mala Plješevica, meadow Lažipolje, cca 4km N/NE of Donji Lapac, dry grassland, forest edge, N: 44,588987, E: 15,971300, 748 m, 31-VII-2014, BL
42. Mt. Lisac, middle and lower part of Borovačka jaruga, dry grasslands, N: 44,318739, E: 15,973722, 920 m, 26-VII-2017, RV
43. Mt. Lisac, ridge to the NW and above Borovačka jaruga, rocky slopes with sparse vegetation, N: 44,324497, E: 15,981747, 1070 m, 18-IX-2015, NT, 26-VI-2017, RV
44. Vršina peak between Mazin and Brezovac Dobroselski, grassland surrounded by forest, N: 44,447506, E: 15,981851, 1068 m, 12-VII-2013, NT
45. Mt. Lisac, road Surle - Strmica and the trail to Lisac between 860 - 1160 m, abandoned grasslands, mixed woods, N: 44,334173, E: 15,988206, 1019 m, 27-VI-2015, 17-IX-2015, NT
46. Mt. Lisac, plateau below Lisac peak, western slopes between 1200 - 1340 m, dry grasslands, N: 44,330084, E: 15,990722, 1206 m, 26-VI-2014, BL, 29-VII-2015, NT, LL, 28-VII-2017, BL, 29-VII-2017, BL
47. Mt. Lisac, near the peak and southern slopes, dry rocky grasslands, tall grass meadow, N: 44,333575, E: 15,994503, 1300 m, 26-VI-2017, RV, 28-30-VII-2017, BL
48. Ozeblin, Gornji Lapac, settlement Gajine, dry grasslands with bushes and trees, N: 44,526731, E: 16,000374, 597 m, 28-VII-2014, BL
49. Mazin, SE of the village, Bukovačka Draga, forest path, N: 44,435060, E: 16,008641, 1146 m, 12-VII-2013, NT
50. Mt. Kremen, Gornji Lapac, Poljana, meadow surrounded by forest, N: 44,482173, E: 16,011506, 1032 m, 29-VII-2014, BL
51. Brezovac Dobroselski, SW of the village, toponym Klanci, forest edge and forest glades, N: 44,442276, E: 16,028719, 996 m, 12-VII-2013, NT
52. Gornja Suvaja, Čemernica meadows west of the settlement, N: 44,402098, E: 16,035524, 1094 m, 23-VI-2014, BL
53. Veliko Popinsko polje, W of Lukići and toward Srpski Klanac, partially overgrown pastures, N: 44,282385, E: 16,043992, 668 m, 20-VII-2016, 26-VII-2016, 7-VII-2017, NT
54. Gračac, Zrmanja, at a large spring at the N edge of the village, forest edge, abandoned dry grassland, N: 44,196406, E: 16,056494, 297 m, 8-VIII-2014, RV, 5-VIII-2015, RV, 13-VII-2018, RV, 6-VIII-2019, RV
55. Gračac, Zrmanja, pastures on the E side of the river E of village Zrmanja Vrelo, N: 44,194686, E: 16,059772, 380 m, 9-VII-2011, RV
56. Gornji Srb, meadows Mala Čemernica, 5km NW of the settlement, forest edge, grasslands, N: 44,374213, E: 16,064198, 1124 m, 24-VI-2014, BL
57. Gornja Suvaja, surroundings of Čopići settlement, pastures, ruderal habitats, N: 44,406314, E: 16,071493, 571 m, 23-VI-2014, BL
58. Gračac, Zrmanja, valley at the spring of the river NE of village Zrmanja Vrelo, woods along the stream, rocky slopes with sparse vegetation, N: 44,203889, E: 16,074061, 303 m, 9-VII-2011, RV, 11-VIII-2011, RV, 8-VIII-2014, RV, 5-VIII-2015, RV, 20-VII-2016, NT, 26-VI-2017, RV
59. Mt. Poštak, along the road NE of Otrić, plateau at Kamenita glavica, abandoned dry grasslands, N: 44,261569, E: 16,089089, 980 m, 22-VI-2014, RV, 8-VIII-2014, RV, 1-VII-2015, RV, 5-VIII-2015, RV, 26-VI-2017, RV, 13-VII-2018, RV
60. Kupirovo, between Srb and Srpski klanac, dry grasslands, N: 44,301546, E: 16,089298, 789 m, 6-VI-2015, NT
61. Mt. Poštak, grasslands near small quarry at Ljubina Poljana, N: 44,261226, E: 16,102745, 1094 m, 7-VI-2014, NT, 22-VI-2014, RV, 1-VII-2015, RV, 5-VIII-2015, RV, 8-12-VII-2017, BL, 13-VII-2018, RV
62. Mt. Poštak, pastures near the top of the mountain and on SW slopes, N: 44,252803, E: 16,105508, 1250 - 1420 m, 22-VI-2014, RV, 1-VII-2015, RV, 11-VII-2017, BL
63. Mt. Poštak, meadow Ljubina poljana, northern slopes, dry grasslands, N: 44,262974, E: 16,106546, 1067 m, 21-VI-2014, BL
64. Mt. Poštak, Međugorje, N of Kirin vrh, near road to Jelovi Tavani, forest track, mixed woods, N: 44,287901, E: 16,109056, 1066 m, 7-VI-2014, 23-IX-2014, NT

65. Mt. Poštak, E slopes, dry rocky grasslands, N: 44,255135, E: 16,113831, 1374 m, 9-11-VII-2017, BL
 66. Srb, Donja Suvaja, along forest track E of Zalužje village, N: 44,417961, E: 16,121569, 390 m, 22-VI-2014, RV
 67. Kunovac Kupirovački, at Velika bara, wooded stream banks, dry grasslands, N: 44,345097, E: 16,135991, 446 m, 22-VI-2014, BL
 68. Srb, Kunovac Kupirovački, along forest road in a valley SE of the village, N: 44,321044, E: 16,136575, 530 m, 22-VI-2014, RV
 69. Srb, Donja Suvaja, along a track in the gorge of Una river E of Zalužje village, dry grasslands, rocky slopes, N: 44,418592, E: 16,137892, 380 m, 22-VI-2014, RV
 70. Mt. Poštak, NE slopes of hill Visočica, meadows Palež, forest edge, N: 44,267572, E: 16,148236, 933 m, 21-VI-2014, BL, 31-VII-2014, BL
 71. Gornji Srb, Zavlaka village, meadows and forest edge, N: 44,315826, E: 16,176171, 749 m, 22-VI-2014, BL



Results and discussion

In total, 142 species were recorded during our surveys of Mt. Lička Plješevica range, including 12 new for this region (*Heteropterus morpheus* (Pallas, 1771), *Colias caucasica* Staudinger, 1871, *Favonius quercus* (Linnaeus, 1758), *Leptotes pirithous* (Linnaeus, 1767), *Plebejus argyrognomon* (Bergsträsser, 1779), *Thecla betulae* (Linnaeus, 1758), *Araschnia levana* (Linnaeus, 1758), *Boloria selene* ([Denis & Schiffermüller], 1775), *Erebia aethiops* (Esper, 1777), *Melitaea britomartis* Assmann, 1847, *Melitaea ornata* Christoph, 1893, and *Minois dryas* (Scopoli, 1763)). In the previous surveys in the southern part of the massif, in particularly Mt. Poštak and the source of Zrmanja River (KOREN *et al.*, 2015), three additional species not recorded during our survey were found: *Polyommatus escheri* (Hübner, [1823]), *Proterebia phegea* (Borkhausen, 1788), and *Melanargia larissa* (Geyer, [1828]). Additional species mentioned for Mt. Plješevica but not confirmed during recent surveys are *Euphydryas maturna* (Linnaeus, 1758) found in Una River canyon (TVRTKOVIĆ *et al.*, 2015), *Boloria titania* (Esper, 1793) recorded almost 100 years ago (STEINER, 1938) and *Nymphalis vaualbum* ([Denis & Schiffermüller], 1775) recorded by Hochetlinger in 1909 (FRANIĆ, 1910) and Lorković in

1923 (LORKOVIĆ, 2009). With these records, the butterfly fauna of Lička Plješevica range comprises 152 species. This positions the Lička Plješevica range as the second butterfly richest mountain chain in Croatia, just after Velebit Mts., for which a total of 153 species were recorded (TVRTKOVIĆ *et al.*, 2015).

The comparison of biogeographical affiliation between Mts. Lička Plješevica, Velebit and Dinara revealed a similar number of species per affiliation type (Table III). The most noticeable difference is in the smaller number of montane (MON) species on Lička Plješevica (5) in comparison with Velebit (10) and Dinara (7). This is likely a result of general lower altitude of Lička Plješevica and very small and isolated subalpine habitats limited to a few highest peaks in the range. Entire Lička Plješevica massif is also shorter than Velebit Mountain chain. Throughout its length, it stretches in the northwest-southeast direction - the position supporting microrefugia's and north south migrations of more northern continental species during climatic fluctuations.

Table III.– Differences in biogeographical affiliation of butterflies of Lička Plješevica, Velebit and Dinara. The abbreviations of biogeographic affiliations are as follows: ES - Euro-Siberian, EO - Euro-Oriental, Mon - Montane, Hol - Holarctic, EM - Euro-Meridional, BM - Boreo-Montane, MED - Mediterranean, TRO - Tropical, COS - Cosmopolitan.

	Lička Plješevica	Velebit	Dinara
BM	1	1	1
COS	1	1	1
EM	9	8	7
EO	45	44	42
ES	76	74	61
HOL	11	8	6
MED	3	3	2
MON	5	10	7
TRO	1	4	1

Among the species listed, several were recorded at 30 or more sites and could be considered common and widespread in the Lička Plješevica range: *Ochlodes sylvanus* (Esper, 1777), *Papilio machaon* Linnaeus, 1758, *Colias crocea* (Geoffroy, 1785), *Gonepteryx rhamni* (Linnaeus, 1758), *Aporia crataegi* (Linnaeus, 1758), *Polyommatus icarus* (Rottemburg, 1775), *Vanessa cardui* (Linnaeus, 1758), *Maniola jurtina* (Linnaeus, 1758), *Melanargia galathea* (Linnaeus, 1758), and *Coenonympha arcania* (Linnaeus, 1760).

On the other hand, several species were observed only at a single location and are possibly extremely rare in the region: *Heteropterus morpheus* (Pallas, 1771), *Colias caucasica* Staudinger, 1871, *Favonius quercus* (Linnaeus, 1758), *Iolana iolas* (Ochsenheimer, 1816), *Boloria selene* ([Denis & Schiffermüller], 1775), *Aphantopus hyperantus* (Linnaeus, 1758), *Hyponephele lycaon* (Kühn, 1774), *Hyponephele lupinus* (Costa, 1836), *Limnitis populi* (Linnaeus, 1758), *Melitaea ornata* Christoph, 1893, and *Neptis rivularis* (Scopoli, 1763).

According to the Red Data List of Croatian Butterflies (ŠAŠIĆ *et al.*, 2015), four of the recorded species are considered vulnerable (VU): *Phengaris alcon* f. *rebeli* (Hirschke, 1904), *Phengaris arion* (Linnaeus, 1758), *Polyommatus damon* ([Denis & Schiffermüller], 1775), and *Parnassius apollo* (Linnaeus, 1758). Additionally, 11 species among those observed are considered near threatened (NT): *Heteropterus morpheus* (Pallas, 1771), *Papilio machaon* Linnaeus, 1758, *Zerynthia polyxena* ([Denis & Schiffermüller], 1775), *Parnassius mnemosyne* (Linnaeus, 1758), *Glaucopsyche alexis* (Poda, 1761), *Polyommatus thersites* (Cantener, 1835), *Pseudophilotes vicrama* (Moore, 1865), *Scolitantides orion* (Pallas, 1771), *Apatura ilia* ([Denis & Schiffermüller], 1775), *A. iris* (Linnaeus, 1758), *Euphydryas*

maturna (Linnaeus, 1758), *Euphydras aurinia* (Rottemburg, 1775), and *Erebia medusa* ([Denis & Schiffermüller], 1775). Four species *Thymelicus action* (Rottemburg, 1775), *Pieris brassicae* (Linnaeus, 1758), *Melitaea aurelia* Nickerl, 1850, and *M. britomartis* Assmann, 1847 are considered as data deficient (DD).

The highest diversity with more than 50 species per locality was recorded in the southernmost part of the range near Zrmanja Vrelo (KOREN *et al.*, 2011: 86 species), in the Ozeblin Mt. - Kozja Draga (76 species), Mala Plješevica Mt.: Bijeli potoci, Poljane (68), Mt. Poštak: plateau at Kamenita glavica (66) and grasslands at Ljubina Poljana (56).

Faunistically all compared mountain ranges are similar in composition. For example, Mt. Dinara when compared to Lička Plješevica, has only four additional species, all limited to highest elevations: *Polyommatus eros* (Ochsenheimer, 1808), *Erebia euryale* (Esper, 1805), *Erebia ottomana* Herrich-Schäffer, 1847, and *Erebia triarius* (Prunner, 1798) (TVRTKOVIĆ *et al.*, 2012; KOREN & LAUŠ, 2013). The Velebit Mts. however, host 18 additional species so far not recorded on Mt. Lička Plješevica (MIHOČI *et al.*, 2007; TVRTKOVIĆ *et al.*, 2015). Among these, *Gegenes pumilio* (Hoffmansegg, 1804), *Cacyreus marshalli* Butler, 1898, *Lampides boeticus* (Linnaeus, 1767), *Tarucus balkanica* (Freyer, 1844), *Charaxes jasius* (Linnaeus, 1767), *Polygonia egea* (Cramer, 1775), and *Gonepteryx cleopatra* (Linnaeus, 1767) are Mediterranean species, mostly confined to the coastal areas at lower elevations and the foothills of Velebit Mts., and are not to be expected so far inland on Lička Plješevica. Velebit Mts. also harbour some high alpine species not present on Lička Plješevica: *Polyommatus eros* (Ochsenheimer, 1808), *Erebia epiphron* (Knoch, 1783), *Erebia euryale* (Esper, 1805), *Erebia gorge* (Hübner, [1804]), *Erebia ottomana* Herrich-Schäffer, 1847, *Erebia pronoe* (Esper, 1780), and *Erebia stiria* (Godart, 1824). Additionally, there are single records from Velebit Mts. of species that could eventually be found also on Lička Plješevica such as *Satyrrium pruni* (Linnaeus, 1758), *Cupido alcetas* (Hoffmansegg, 1804), *Colias hyale* (Linnaeus, 1758), and *Neptis sappho* (Pallas, 1771).

During this survey, several interesting or unexpected species were recorded. For each of them additional information on their occurrence and distribution in Croatia is discussed.

Pyrgus serratulae (Rambur, 1839)

This species was considered very local and rare in Croatia, with only several existing records from Velebit Mts. (LORKOVIĆ, 2009). However, in the recent surveys it was recorded on several new mountain ranges including Mt. Poštak (KOREN *et al.*, 2015a), Dinara Mts. (TVRTKOVIĆ *et al.*, 2012, Tvrtković pers. obs. from 550 to 1450 m a.s.l.), Biokovo Mts. (KAČIREK, 2017) and Mt. Kozjak (KOREN *et al.*, 2019). We recorded it at seven localities: Frkašić - surroundings of pond Jezero, Kozja draga valley, Bijeli potoci - Poljane meadow, Međugorje - Magarčev do, Mt. Kremen, and Mt. Lisac. The species is not rare on Mt. Plješevica and in some localities it was even abundant. The main reasons for the lack of records in Croatia are the similarity with the other larger *Pyrgus* species and the absence of targeted surveys.

Pyrgus sidae (Esper, 1784)

One of the most local and rare species of the genus *Pyrgus* in Croatia was not even included in the overview of the butterflies of Croatia written by Zdravko Lorković in the 1950's (LORKOVIĆ, 2009), and neither was it represented in the collection of Croatian National Zoological Museum (today Croatian Natural History Museum) in Zagreb (MLADINOV, 1975). So far this species has been recorded from Josipdol, Gorski Kotar (MANN, 1867), Mt. Poštak (KOREN *et al.*, 2015), Mt. Dinara, from 250-780 m a.s.l. (TVRTKOVIĆ *et al.*, 2012; KOREN & LAUŠ, 2013) in NW Dalmatia (HABELER, 1976) and Mt. Biokovo at 650 and 700 m a.s.l. (MIHOČI *et al.*, 2011). While most of the records originate from montane areas, the records from Tisno and Vodice, near the sea level in Dalmatia (HABELER, 1976) show that it also inhabits lowland calcareous areas. Beside the above mentioned record for Mt. Poštak, we recorded this species at two new localities, between Ondić and Rudopolje Bruvanjsko and on Mt. Lisac. The species was recently recorded also from further localities in central and Southern Dalmatia (KOREN *et al.*, 2019).

Colias caucasica Staudinger, 1871

This species has been only recently added as a member of the fauna of Croatia, with several males collected and observed at Mt. Dinara but without finding of the larval host-plant (TVRTKOVIĆ *et al.*, 2011). The observation from Mt. Poštak represents the second sighting for this species in Croatia, and it is at a distance of about 30 km north-west from Mt. Dinara. Only a single fresh male was observed so far, despite repeated efforts to make additional observations in the main flight period for the species. The potential host plant of the genus *Chamaecytisus* sp. is abundant on the southern slopes of Mt. Poštak, indicating a possible residence of the species on the mountain. It is also possible that it will be recorded in other high altitude grassland areas of southern Lička Plješevica range in the future.

Pieris napi / balcana

With the chromosome examination of *Pieris napi* and *P. balcana*, LORKOVIĆ (1989) found their contact zone and noted hybridisation in Plitvice area in the foothills of the Velika Plješevica. We confirmed another contact zone in Mala Plješevica. From the collected specimens, several were barcoded (Lovrenčić, personal information). *Pieris napi* was recorded in Bijeli potoci: Poljana (specimen with typical *P. napi* wing markings), and *P. balcana* from Poštak Mt. (890 m a.s.l.), Glogovo (830 m a.s.l.), Brezovac Dobroselski: Klanci (950 m a.s.l.) and Kremen: Kremenščak (110 m a.s.l.). Typical *P. balcana* wing characters were found in collected specimens from Ponor Korenički, Bijeli Potoci, Lisac, Surle, Glogovo, Kremen, Brezovac Dobroselski, Zrmanja Vrelo and Poštak (W-slope and Ljubina Poljana). Published records for *P. napi* based only on observations (KOREN *et al.*, 2011; KOREN *et al.*, 2015) in the southern part of the range require confirmation.

Eumedonia eumedon (Esper, 1780)

Most records of *E. eumedon* in Croatia originate from the mountains located along the coastline of Croatia, from Mt. Učka (WITHRINGTON, 1984; MLADINOV & LORKOVIĆ, 1985), to Gorski Kotar (MLADINOV & LORKOVIĆ, 1985; KOREN, 2012), and across Velebit Mts. (GRUND, 1916; MLADINOV, 1973; LORKOVIĆ, 2009). During our surveys it was recorded on Mala Plješevica (Bijeli potoci), Mt. Kremen, Mt. Lisac, Gornja Suvaja, and confirmed for Mt. Poštak. These records, along with a recent record from Markov grob, Dinara (Verovnik, pers. obs) represent the southernmost records in Croatia, and fill the distribution gap towards known range in the neighbouring Bosnia and Herzegovina (LELO, 2008).

Cupido osiris (Meigen, 1829)

This species is very locally distributed in Croatia (LORKOVIĆ, 2009), with only a few historical records. MANN (1869) reports it from Central Dalmatia, HABELER (1976) from Podgora at the foothills of Mt. Biokovo, HAFNER (1994) from surroundings of Knin and BURGERMEISTER (1964) from Ombla. Recently it was found on Dinara Mt. (TVRTKOVIĆ *et al.*, 2012; Verovnik pers. obs.) and Mt. Poštak (KOREN *et al.*, 2015). During this survey, we recorded it on two localities, Bijeli potoci (Mala Plješevica Mt.) and Zrmanja spring. Only individual specimens were observed on both localities. Despite its limited distribution and specific habitat requirements (VEROVNIK, 2011a) it is not listed in the Red book of butterflies of Croatia (ŠAŠIĆ *et al.*, 2015), therefore its status in Croatia should be rewised.

Phengaris arion (Linnaeus, 1758)

This is a rather localised but widely distributed species in montaneous parts of Croatia (ŠAŠIĆ *et al.*, 2015). It inhabits the continental area of Croatia, where it is very local and always connected to thermophilous slopes with larval host plants (*Thymus* sp., *Origanum* sp.). It is more widespread in the mountainous areas of Gorski Kotar and Velebit Mts. In the surveyed area, we recorded it at 12 localities, with several observed specimens. Highest densities were noted on Mt. Lisac and Mt. Poštak, while in other localities only single specimens were observed.

Plebejus argyrognomon / *idas*

The Reverdin's Blue is distributed in Croatia only in northern lowland part of the country (LORKOVIĆ, 2009), with the southernmost locality near Bosiljevo, in the northern foothills of the Mt. Velika Kapela. (Gorski Kotar) (MLADINOV, 1973). New records from the localities in Lička Plješevica range (Zrmanja source, Donja Suvaja near Srb, Kupirevo) are important because they represent isolated populations at the southern border of species distribution in Croatia. Two previously published records of *P. argyrognomon* from Velebit Mts. and Dinara Mt. (MIHOCI *et al.*, 2007; TVRTKOVIĆ *et al.*, 2012), are possibly not valid. MIHOCI *et al.* (2007) repeated the quotation of KUČINIĆ *et al.* (1995) who erroneously listed the species after GRUND (1916). In Grund's time (see GRUND, 1913) *P. idas* was considered as a subspecies of *P. argyrognomon*. The findings from Velebit's localities are correctly interpreted by MLADINOV (1973) as *P. idas*. TVRTKOVIĆ *et al.* (2012) wrongly noted *P. argyrognomon* for Dinara Mt. based on barcoded female with identical barcode as several *P. argyrognomon* specimens from Europe (GenBank, accessed on 3-XII-2012). Later all collected males from the same locality on Dinara Mt. showed genitalia typical for *P. idas*. Specimens of *P. idas* from the area have very variable wing-markings, sometimes similar to those of *P. argyrognomon*.

Polyommatus thersites (Cantener, 1835)

As it is the case with many species in Croatia, our knowledge about the occurrence and distribution of the species has considerably improved in the past several years. Only a decade ago, less than ten localities were known for this species in Croatia (HABELER, 2003; MIHOCI & ŠAŠIĆ, 2006). It has been recently recorded also from Istria Peninsula (KOREN & LADAVAC, 2010), northern Dalmatia hinterland (VEROVNIK *et al.*, 2015), in different localities in southern part of Lička Plješevica range (KOREN *et al.*, 2011; KOREN *et al.*, 2015), south-eastern Velebit Mts. (Javornik, leg. NT, July 2016), and Dinara Mt. (TVRTKOVIĆ *et al.*, 2012; KOREN & LAUŠ, 2013). During this survey it was recorded at four new localities: Udbina near Kurjak, Kozja draga valley, Mt Lisac Surle - Strmica, and Veliko Popinsko polje. Additionally, it was confirmed at Zrmanja vrelo and Mt. Poštak. It was usually found in open dry grasslands or road verges with abundance of its larval hostplant, *Onobrychis arenaria* (Kit.) DC and/or *O. vicifolia* Scop. The species was moderately abundant at most localities with suitable habitat. Additional efforts are needed in order to remove potential gaps in the knowledge of its distribution in Croatia.

Thecla betulae (Linnaeus, 1758)

The Brown Hairstreak is one of the last species of butterflies to emerge in late summer, and due to that and its secretive lifestyle it may be easily overlooked during the butterfly surveys. Adults are generally scarce and local, usually flying in the treetops of ash trees and rarely visiting flowers, like *Eupatorium cannabinum* L. In Croatia, this is a rather local species, distributed in the continental biogeographic region, while in the coastal region it is extremely local, so far recorded only from Plitvice spring, Drežnik and Ogulin (LORKOVIĆ, 2009). Recently it was for the first time recorded on Velebit Mts. in Paklenica Gorge (TVRTKOVIĆ *et al.*, 2015). Our records from Mt. Velika Plješevica and Ličko Petrovo selo represent important new records and fill a distribution gap towards the known range in Bosnia and Herzegovina (LELO, 2004).

Brenthis ino (Rottemburg, 1775)

The species was considered to be one of the rarest nymphalids in Croatia (MIHOCI & ŠAŠIĆ, 2005), however, it has been recorded in several new regions during the last years, although not from Mt. Poštak (KOREN *et al.*, 2015a) or Dinara Mt. (KOREN & LAUŠ, 2013). The closest records to the study area are from northern Velebit Mts., where it was recorded only a decade ago (MIHOCI *et al.*, 2007). Its distribution in Croatia includes northern Istria, and stretches across the montaneous parts of Croatia to the north as far as Hrvatsko Zagorje (KOREN *et al.*, 2017), and parts of Slavonia (KOREN & LETIĆ, 2014). During our survey, we recorded it at nine localities at Velika Plješevica (meadows

between Krgin vršak and Jukanova draga), Mala Plješevica (Bijeli potoci, Ruda Polja), Mt Kremen, Mt. Lisac and Mt. Poštak. (Tab. 1). It is possible that it will be recorded in other humid grassland areas in the region.

Limenitis populi (Linnaeus, 1758)

This species has very limited records in Croatia, and is mostly confined to the woodland areas of the north-western part of the country, with only a few scattered records from Gorski Kotar (Fužine) region (LORKOVIĆ, 2009). A single specimen was observed at the locality Bukovačka Draga at 1138 m a.s.l.. This is only the second record for Mt. Plješevica (FRANIČ, 1910), with the closest records originating from Velebit Mts. (BERRA, 1982; MIHOCI *et al.*, 2007). The species is listed as near threatened in Croatia (ŠAŠIĆ *et al.*, 2015), therefore further studies in suitable forest dominated areas are required to assess its distribution and endangerment.

Neptis rivularis (Scopoli, 1763)

In the view of the recent observations from Dinara Mts. (TVRTKOVIĆ *et al.*, 2012) and Mt. Kamešnica (KOREN & LAUŠ, 2013), the record from Lička Plješevica fills the distribution gap of this species in Croatia, and indicates it has a wider distribution in the region. Several individuals were observed gliding near the forest edge at the locality Kozja Draga. The species was recently observed also in other lower parts of the Lika region outside studied area (personal observations of the authors).

Melitaea britomartis Assmann, 1847

The distribution of this species in Croatia has been poorly known until recently (KOREN & JUGOVIĆ, 2012). In general, this species is distributed in north-western part of Croatia, with a single record from the Lika region, and one from the Mt. Troglav in Bosnia and Herzegovina (KOREN & JUGOVIĆ, 2012). During this survey, it was recorded on Mt. Plješevica at the locality Bijeli Potoci. This is the second record of this species for Lika region. It indicates that further records of this species may be expected, so sampling of small *Melitaea* in the region is mandatory.

Araschnia levana (Linnaeus, 1758)

According to Lorković manuscript from 1954 (LORKOVIĆ, 2009) this species is widespread in most of the northern continental part of Croatia, especially near rivers. This species is notably absent from Istria, and across most of the Adriatic coastline. The only notable exceptions are the records from Split (STAUDER, 1922), Mljet Island (KUČINIĆ *et al.*, 2011) and Vis Island (WITHRINGTON & VEROVNIK, 2008), but these findings were not confirmed by recent surveys (TVRTKOVIĆ *et al.*, 2010; TVRTKOVIĆ *et al.*, 2015; KOREN *et al.*, 2015). During our surveys, we recorded the species at four localities in the Lička Plješevica range at Prijeboj, meadows between Krgin vršak and Jukanova draga, Bijeli potoci at Poljane, and along forest track E of Zalužje village near Donja Suvaja. These are the first records of this species for the Lika region.

Conclusions

During the last decade, a significant increase in the number of publications dealing with the butterfly fauna of previously understudied areas of Croatia is evident. This includes the studies of the butterfly diversity of the Adriatic islands (WITHRINGTON & VEROVNIK, 2008; KOREN *et al.*, 2014; KUČINIĆ *et al.*, 2011; VEROVNIK, 2011b), coastal areas of Dalmatia (KUČINIĆ *et al.*, 2015; VEROVNIK *et al.*, 2015) as well as the montaneous areas in southern Croatia (MIHOCI *et al.*, 2011; KOREN & LAUŠ, 2013; KOREN *et al.*, 2015; KOREN *et al.*, 2019). Still, many areas remain poorly surveyed, and their fauna almost completely unknown. One of such areas was Lička Plješevica range which has proved to host one of the most diverse butterfly faunas in Croatia.

Such high species diversity could be explained by high habitat heterogeneity, especially with pastures and grasslands in different stages of abandonment. For many centuries, herdsman from the

Lika and Velebit Mts. region led their livestock to summer pastures at higher elevations throughout most of the Lička Plješevica range (HORVAT, 1925; MARKOVIĆ, 2003). These practices are nowadays almost completely abandoned, and almost no pasturing was observed in the region during our visits. The only exception is Mt. Lisac, where small number of cows and sheep were observed grazing at lower altitudes. Although mowing is still practiced in the region, it is only evident near the settlements where people still persist. One of the highest species diversity was observed at Kozja Draga where some of the grasslands are still mowed. Such open-grassland localities are in danger of disappearing in the near future as grazing and mowing in the region of Lička Plješevica are almost entirely abandoned. Even within the span of our surveys in the last decade the succession is already visible, with small patches of previously open meadows becoming almost entirely covered with bushes. While it is difficult, or almost impossible to return the farming practices common only few decades ago, given the current demographic trends in the region, it is important to survey all remaining butterfly suitable areas in the region and maintain at least some sort of management in the areas with high diversity or presence of threatened butterfly species.

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Table I.– Checklist of species recorded so far on Lička Plješevica with current distribution records and data from the literature. Locality numbers correspond to those in Materials and methods section and figure 1.

List of species	Locality number	References
Hesperiidae		
1. <i>Hesperia comma</i> (Linnaeus, 1758)	6, 15, 43, 58	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
2. <i>Ochlodes sylvanus</i> (Esper, 1777)	3, 5, 8, 9, 11, 13, 14, 15, 16, 19, 21, 23, 26, 27, 28, 31, 33, 38, 40, 41, 43, 45, 47, 56, 57, 58, 59, 61, 62, 65, 67, 69	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
3. <i>Thymelicus acteon</i> (Rottemburg, 1775)	58, 59	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
4. <i>Thymelicus lineola</i> (Ochsenheimer, 1808)	2, 6, 11, 15, 19, 26, 31, 33, 40, 42, 43, 45, 59, 61, 62, 65, 69	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
5. <i>Thymelicus sylvestris</i> (Poda, 1761)	2, 8, 11, 15, 19, 31, 33, 36, 40, 42, 43, 45, 59, 61, 65	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
6. <i>Carterocephalus palaemon</i> (Pallas, 1771)	15, 28, 31	TVRTKOVIĆ <i>et al.</i> (2015)
7. <i>Heteropterus morpheus</i> (Pallas, 1771)	37	
8. <i>Carcharodus alceae</i> (Esper, 1780)	54, 58	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
9. <i>Carcharodus floccifera</i> (Zeller, 1847)	40, 42	KOREN <i>et al.</i> (2011)
10. <i>Carcharodus lavatherae</i> (Esper, 1783)	59, 68, 69	KOREN <i>et al.</i> (2011)
11. <i>Erynnis tages</i> (Linnaeus, 1758)	3, 5, 10, 15, 19, 31, 32, 38, 39, 40, 41, 42, 45, 47, 48, 54, 55, 58, 59, 60, 61	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
12. <i>Pyrgus alveus</i> (Hübner, [1803])	19, 31, 61	KOREN <i>et al.</i> (2015)
13. <i>Pyrgus armoricanus</i> (Oberthür, 1910)	15, 58, 69	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
14. <i>Pyrgus carthami</i> (Hübner, [1813])	15, 19, 31, 33, 61	LORKOVIĆ (2009), KOREN <i>et al.</i> (2015)
15. <i>Pyrgus malvae</i> (Linnaeus, 1758)	5, 10, 15, 31, 39, 60, 61	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
16. <i>Pyrgus serratulae</i> (Rambur, 1839)	11, 15, 19, 31, 33, 43, 47	KOREN <i>et al.</i> (2015)
17. <i>Pyrgus sidae</i> (Esper, 1784)	13, 43	KOREN <i>et al.</i> (2015)
18. <i>Spialia orbifer</i> (Hübner, [1823])	15, 31, 42, 52, 54, 58, 59, 62, 64	KOREN <i>et al.</i> (2015)
19. <i>Spialia sertorius</i> (Hoffmansegg, 1804)		FRANIĆ (1910)
Papilionidae		
20. <i>Iphiclides podalirius</i> (Linnaeus, 1758)	1, 3, 8, 10, 15, 38, 39, 46, 47, 54, 55, 58, 59, 61, 63, 64, 65, 70	FRANIĆ (1910), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
21. <i>Papilio machaon</i> Linnaeus, 1758	1, 8, 15, 19, 21, 26, 27, 28, 33, 34, 38, 40, 43, 45, 46, 47, 54, 58, 61, 62, 63, 65, 66	FRANIĆ (1910), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
22. <i>Zerynthia polyxena</i> ([Denis & Schiffermüller], 1775)	15, 31, 34	KOREN <i>et al.</i> (2011)
23. <i>Parnassius apollo</i> (Linnaeus, 1758)	5, 8, 12, 14, 16, 23, 59, 61, 65	LORKOVIĆ (2009), MLADINOV (1973), MLADINOV & LORKOVIĆ (1985), KOREN <i>et al.</i> (2015)

24.	<i>Parnassius mnemosyne</i> (Linnaeus, 1758)	5, 16, 21, 26, 28, 33, 56, 61, 63	FRANIĆ (1910), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
	Pieridae		
25.	<i>Colias alfacariensis</i> Ribbe, 1905	6, 9, 15, 19, 31, 36, 39, 40, 41, 43, 45, 47, 48, 54, 55, 60, 61	KOREN <i>et al.</i> (2011)
26.	<i>Colias caucasica</i> Staudinger, 1871	62	
27.	<i>Colias crocea</i> (Geoffroy, 1785)	1, 5, 6, 8, 9, 10, 15, 16, 19, 24, 28, 31, 36, 38, 40, 41, 43, 45, 46, 47, 48, 53, 54, 55, 56, 57, 58, 59, 61, 63, 67, 69	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
28.	<i>Gonepteryx rhamni</i> (Linnaeus, 1758)	1, 3, 5, 8, 10, 15, 16, 19, 23, 27, 31, 32, 33, 34, 35, 39, 42, 43, 45, 46, 47, 52, 55, 56, 57, 58, 59, 61, 62, 63, 65, 67, 68, 71	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
29.	<i>Leptidea cf. sinapis</i> (Linnaeus, 1758)	2, 5, 10, 15, 19, 26, 28, 31, 39, 42, 45, 47, 54, 55, 58, 59, 60, 61, 62, 63, 65, 66, 69, 70	LORKOVIĆ (2009), SIJARIĆ (1964, 1991) KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
30.	<i>Anthocharis cardamines</i> (Linnaeus, 1758)	5, 10, 15, 19, 39	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
31.	<i>Aporia crataegi</i> (Linnaeus, 1758)	2, 11, 13, 19, 26, 28, 31, 32, 33, 34, 35, 36, 38, 40, 42, 43, 45, 46, 47, 52, 56, 57, 59, 60, 61, 62, 63, 65, 66, 67, 68, 69, 71	FRANIĆ (1910), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
32.	<i>Pieris balcana</i> Lorkovič, 1969	19, 21, 26, 28, 31, 33, 39, 43, 45, 51, 54, 58, 59, 61	LORKOVIĆ (1989), KOREN <i>et al.</i> (2015)
	<i>Pieris napi</i> - <i>balcana</i> complex	2, 4, 6, 7, 12, 15, 22, 30, 31, 43, 47, 48, 50, 51, 66, 67, 69	LORKOVIĆ (1989), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
33.	<i>Pieris napi</i> (Linnaeus, 1758)	11	FRANIĆ (1910), LORKOVIĆ (2009)
34.	<i>Pieris brassicae</i> (Linnaeus, 1758)	1, 5, 7, 15, 16, 19, 21, 26, 27, 28, 42, 54, 56, 58, 59, 60, 61, 63, 65, 67	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
35.	<i>Pieris ergane</i> (Geyer, [1828])	15, 21, 26, 28, 31, 33, 42, 47, 54, 58, 59, 60, 65, 68, 69	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
36.	<i>Pieris mannii</i> (Mayer, 1851)	15, 16, 19, 21, 26, 27, 28, 31, 43, 56, 58, 59, 61, 63, 64, 65	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
37.	<i>Pieris rapae</i> (Linnaeus, 1758)	9, 15, 19, 21, 26, 28, 31, 32, 45, 54, 56, 58, 59, 61, 63, 65, 66, 69, 70	FRANIĆ (1910), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
38.	<i>Pontia edusa</i> (Fabricius, 1777)	61	KOREN <i>et al.</i> (2015)
39.	<i>Euchloe ausonia</i> (Hübner, [1804])		KOREN <i>et al.</i> (2011)

	Riodinidae		
40.	<i>Hamearis lucina</i> (Linnaeus, 1758)	19, 56	KOREN <i>et al.</i> (2015)
	Lycaenidae		
41.	<i>Lycaena alciphron</i> (Rottemburg, 1775)	32, 40, 43, 47, 56, 59, 61, 65	KOČA (1901), FRANIĆ (1910), MLADINOV (1973), KOREN <i>et al.</i> (2015)
42.	<i>Lycaena candens</i> (Herrich-Schäffer, 1844)	16, 19, 28, 32, 61	LORKOVIĆ (2009), KOREN <i>et al.</i> (2015)
43.	<i>Lycaena phlaeas</i> (Linnaeus, 1760)	15, 54, 55, 58, 59, 60, 61, 65	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
44.	<i>Lycaena thersamon</i> (Esper, 1784)		KOREN <i>et al.</i> (2011)
45.	<i>Lycaena tityrus</i> (Poda, 1761)	1, 6, 15, 40, 47, 57, 61, 63	KOREN <i>et al.</i> (2015)
46.	<i>Lycaena virgaureae</i> (Linnaeus, 1758)	1, 3, 15, 16, 19, 23, 27, 29, 40, 41, 42, 46, 47, 59, 61, 65	FRANIĆ (1910), LORKOVIĆ (2009), KOREN <i>et al.</i> (2015)
47.	<i>Aricia agestis</i> ([Denis & Schiffermüller], 1775)	1, 3, 6, 8, 9, 13, 14, 15, 16, 19, 24, 27, 31, 38, 41, 46, 47, 48, 52, 54, 55, 56, 57, 58, 59, 61, 63, 65, 70	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
48.	<i>Aricia anteros</i> (Freyer, 1838)	8, 59, 62	KOREN (2012), KOREN <i>et al.</i> (2015)
49.	<i>Aricia artaxerxes</i> (Fabricius, 1793)	11, 15, 19, 31, 40, 42, 45, 59, 61	KOREN (2012), KOREN <i>et al.</i> (2015)
50.	<i>Eumedonia eumedon</i> (Esper, 1780)	19, 33, 40, 47, 52, 62	KOREN <i>et al.</i> (2015)
51.	<i>Celastrina argiolus</i> (Linnaeus, 1758)	1, 15, 16, 19, 21, 26, 27, 41, 54, 58, 59, 61, 69	FRANIĆ (1910), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
52.	<i>Cupido minimus</i> (Fuessly, 1775)	8, 10, 11, 15, 16, 19, 21, 26, 27, 28, 31, 33, 39, 40, 42, 45, 55, 58, 59, 61, 62, 65	REBEL (1895), LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
53.	<i>Cupido osiris</i> (Meigen, 1829)	19, 58	KOREN <i>et al.</i> (2015)
54.	<i>Cupido argiades</i> (Pallas, 1771)	54, 58	KOREN <i>et al.</i> (2011)
55.	<i>Cyaniris semiargus</i> (Rottemburg, 1775)	13, 15, 16, 19, 21, 26, 28, 31, 40, 42, 43, 45, 46, 56, 57, 59, 60, 61, 62, 65	KOREN <i>et al.</i> (2011)
56.	<i>Glaucopsyche alexis</i> (Poda, 1761)	10, 15, 19, 39, 60	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
57.	<i>Iolana iolas</i> (Ochsenheimer, 1816)	58	KOREN <i>et al.</i> (2011)
58.	<i>Leptotes pirithous</i> (Linnaeus, 1767)	19, 54	
59.	<i>Phengaris alcon</i> ([Denis & Schiffermüller], 1775)	1, 15, 17, 19, 20, 27, 31, 34, 40, 42, 43, 44, 45, 46, 47, 50, 61	LORKOVIĆ (2009), KOREN <i>et al.</i> (2015)
60.	<i>Phengaris arion</i> (Linnaeus, 1758)	13, 15, 25, 35, 40, 42, 44, 48, 57, 59, 61, 65	KOREN <i>et al.</i> (2015)
61.	<i>Plebejus argus</i> (Linnaeus, 1758)	6, 9, 11, 15, 19, 31, 40, 42, 45, 47, 54, 55, 58, 59, 60	REBEL (1895), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
62.	<i>Plebejus argyrognomon</i> (Bergsträsser, 1779)	9, 15, 19, 58, 60, 69	
63.	<i>Plebejus idas</i> (Linnaeus, 1761)	47, 59, 61, 69	KOREN <i>et al.</i> (2015)
64.	<i>Lysandra bellargus</i> (Rottemburg, 1775)	6, 15, 40, 42, 54, 58, 60, 68, 69	MLADINOV (1973), KOREN <i>et al.</i> (2015)

65.	<i>Lysandra coridon</i> (Poda, 1761)	1, 3, 6, 9, 15, 19, 24, 27, 31, 41, 43, 46, 47, 53, 54, 58, 59, 61	FRANIĆ (1910), LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
66.	<i>Polyommatus admetus</i> (Esper, 1783)	19, 46, 54, 55, 58, 61, 65	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
67.	<i>Polyommatus damon</i> ([Denis & Schiffermüller], 1775)	15, 54, 58, 61, 65	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
68.	<i>Polyommatus ripartii</i> (Freyer, 1830)	6, 15, 46, 47, 53, 58, 61, 65	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
69.	<i>Polyommatus daphnis</i> ([Denis & Schiffermüller], 1775)	15, 16, 27, 41, 47, 53, 55, 58, 59, 61, 65	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011)
70.	<i>Polyommatus amandus</i> (Schneider, 1792)	16, 19, 26, 31, 32, 33, 39, 40, 42, 43, 45, 47, 56, 59, 60, 61, 62, 63, 65, 69, 70	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
71.	<i>Polyommatus dorylas</i> ([Denis & Schiffermüller], 1775)	8, 15, 19, 31, 40, 45, 46, 47, 52, 55, 56, 57, 58, 59, 60, 61, 62, 69	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
72.	<i>Polyommatus escheri</i> (Hübner, [1823])		KOREN <i>et al.</i> (2015)
73.	<i>Polyommatus icarus</i> (Rottemburg, 1775)	1, 3, 6, 8, 9, 14, 15, 16, 19, 23, 24, 26, 27, 28, 38, 39, 40, 42, 43, 45, 47, 48, 52, 53, 54, 55, 57, 58, 59, 60, 61, 62, 63, 65, 70	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
74.	<i>Polyommatus thersites</i> (Cantener, 1835)	6, 15, 42, 43, 45, 53, 54, 58, 61, 65	KOREN <i>et al.</i> (2011)
75.	<i>Scolitantides orion</i> (Pallas, 1771)	4, 5, 27, 59, 61, 65, 70	LORKOVIĆ (2009), KOREN <i>et al.</i> (2015)
76.	<i>Pseudophilotes vicrama</i> (Moore, 1865)	40, 46, 47, 59, 61, 62, 65	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
77.	<i>Callophrys rubi</i> (Linnaeus, 1758)	15, 19, 31, 39, 52, 60, 61, 63, 70	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
78.	<i>Satyrrium acaciae</i> (Fabricius, 1787)	11, 42, 58, 59, 65	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
79.	<i>Satyrrium ilicis</i> (Esper, 1779)	7, 16, 19, 36, 58, 59	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
80.	<i>Satyrrium spini</i> ([Denis & Schiffermüller], 1775)	1, 5, 7, 8, 14, 15, 16, 31, 42, 47, 58, 59, 61, 65	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
81.	<i>Satyrrium w-album</i> (Knoch, 1782)	1, 15, 19, 27, 65	KOREN <i>et al.</i> (2011)
82.	<i>Favonius quercus</i> (Linnaeus, 1758)	15	
83.	<i>Thecla betulae</i> (Linnaeus, 1758)	1, 7, 8	
Nymphalidae			
84.	<i>Apatura ilia</i> ([Denis & Schiffermüller], 1775)	66, 69	FRANIĆ (1910)
85.	<i>Apatura iris</i> (Linnaeus, 1758)	15, 16, 68	FRANIĆ (1910)
86.	<i>Argynnis paphia</i> (Linnaeus, 1758)	1, 3, 5, 7, 15, 16, 19, 21, 23, 26, 27, 28, 31, 35, 41, 43, 46, 47, 54, 55, 56, 58, 59, 61, 65, 66, 68, 70	FRANIĆ (1910), LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
87.	<i>Argynnis pandora</i> ([Denis & Schiffermüller], 1775)	15, 52, 56, 57, 58, 59, 61, 68, 7	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)

88.	<i>Fabriciana adippe</i> ([Denis & Schiffermüller], 1775)	1, 5, 15, 16, 19, 23, 26, 31, 32, 33, 35, 40, 42, 43, 45, 47, 61, 65	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
89.	<i>Fabriciana niobe</i> (Linnaeus, 1758)	15, 19, 36	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
90.	<i>Speyeria aglaja</i> (Linnaeus, 1758)	3, 5, 7, 15, 16, 19, 21, 23, 26, 27, 28, 31, 32, 33, 35, 41, 43, 46, 47, 59, 61, 62, 65	FRANIĆ (1910), LORKOVIĆ (2009), KOREN <i>et al.</i> (2015)
91.	<i>Boloria dia</i> (Linnaeus, 1767)	40, 42, 61	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
92.	<i>Boloria euphrosyne</i> (Linnaeus, 1758)	15, 19, 31, 33, 61, 63	REBEL (1895), KOREN <i>et al.</i> (2015)
93.	<i>Boloria selene</i> ([Denis & Schiffermüller], 1775)	3	
94.	<i>Boloria titania</i> (Esper, 1793)		STEINER (1938), LORKOVIĆ (2009)
95.	<i>Brenthis daphne</i> (Bergsträsser, 1780)	2, 3, 13, 15, 19, 22, 26, 28, 41, 52, 56, 57, 58, 59, 61, 65, 66, 69	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
96.	<i>Brenthis hecate</i> ([Denis & Schiffermüller], 1775)	13, 16, 19, 21, 26, 27, 28, 31, 32, 40, 42, 43, 45, 46, 47, 56, 58, 59, 61, 62, 65	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
97.	<i>Brenthis ino</i> (Rottemburg, 1775)	3, 19, 26, 33, 40, 43, 45, 59, 61	KOČA (1901)
98.	<i>Issoria lathonia</i> (Linnaeus, 1758)	3, 15, 19, 21, 26, 28, 32, 33, 40, 41, 42, 46, 47, 52, 56, 57, 59, 61, 62, 65, 69	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
99.	<i>Libythea celtis</i> (Laicharting, 1782)	19, 35, 54, 56, 58, 59, 61, 65, 66, 68, 69, 71	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
100.	<i>Limenitis camilla</i> (Linnaeus, 1764)	26, 7	LORKOVIĆ (2009)
101.	<i>Limenitis populi</i> (Linnaeus, 1758)	49	FRANIĆ (1910)
102.	<i>Limenitis reducta</i> Staudinger, 1901	1, 15, 16, 19, 40, 42, 54, 58, 61, 69	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
103.	<i>Neptis rivularis</i> (Scopoli, 1763)	15	LORKOVIĆ (1923), LORKOVIĆ (2009)
104.	<i>Euphydryas aurinia</i> (Rottemburg, 1775)	13, 15, 19, 31, 38, 45, 47, 56, 60, 61, 62, 64, 71	REBEL (1895), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
105.	<i>Euphydryas maturna</i> (Linnaeus, 1758)		TVRTKOVIĆ <i>et al.</i> (2015)
106.	<i>Melitaea athalia</i> (Rottemburg, 1775)	15, 16, 19, 21, 26, 28, 31, 35, 40, 42, 43, 45, 47, 58, 59, 60, 61, 62, 68, 69	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
107.	<i>Melitaea aurelia</i> Nickerl, 1850	15, 19, 40, 42, 45, 69	REBEL (1895), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
108.	<i>Melitaea britomartis</i> Assmann, 1847	19, 26, 40, 43	
109.	<i>Melitaea cinxia</i> (Linnaeus, 1758)	15, 19, 31, 32, 33, 39, 42, 43, 56, 59, 60, 61, 62	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
110.	<i>Melitaea diamina</i> (Lang, 1789)	19, 26, 28, 61	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
111.	<i>Melitaea didyma</i> (Esper, 1778)	15, 19, 31, 42, 45, 47, 58, 59, 61, 63, 68, 70, 71	REBEL (1895), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)

112.	<i>Melitaea ornata</i> Christoph, 1893	59	KOREN & ŠTIH (2013)
113.	<i>Melitaea phoebe</i> ([Denis & Schiffermüller], 1775)	13, 38, 40, 42, 43, 59, 60, 61	FRANIĆ (1910), LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
114.	<i>Melitaea trivia</i> ([Denis & Schiffermüller], 1775)	21, 26, 40, 43, 47, 59, 62, 63	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
115.	<i>Aglais io</i> (Linnaeus, 1758)	1, 8, 16, 19, 21, 23, 26, 27, 28, 31, 32, 33, 35, 36, 45, 46, 56, 59, 61, 62, 66, 71	FRANIĆ (1910), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
116.	<i>Aglais urticae</i> (Linnaeus, 1758)	1, 8, 16, 19, 21, 23, 26, 28, 33, 46, 47, 52, 56, 61, 62, 65, 71	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
117.	<i>Araschnia levana</i> (Linnaeus, 1758)	1, 3, 19, 66	
118.	<i>Nymphalis antiopa</i> (Linnaeus, 1758)	10, 18	KOREN <i>et al.</i> (2011)
119.	<i>Nymphalis polychloros</i> (Linnaeus, 1758)	10, 15, 19, 52, 56, 66, 69, 71	FRANIĆ (1910), LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
120.	<i>Nymphalis vaualbum</i> ([Denis & Schiffermüller], 1775)		FRANIĆ (1910), MOUCHA (1966), LORKOVIĆ (2009)
121.	<i>Polygonia c-album</i> (Linnaeus, 1758)	1, 3, 5, 7, 8, 9, 11, 15, 16, 19, 21, 23, 26, 28, 36, 41, 46, 54, 56, 58, 59, 61, 65, 66	FRANIĆ (1910), MLADINOV (1973), KOREN <i>et al.</i> (2015)
122.	<i>Vanessa atalanta</i> (Linnaeus, 1758)	1, 5, 7, 8, 9, 15, 16, 19, 23, 26, 28, 34, 36, 38, 56, 58, 61, 65, 66	REBEL (1895), KOREN <i>et al.</i> (2015)
123.	<i>Vanessa cardui</i> (Linnaeus, 1758)	1, 3, 5, 6, 8, 9, 11, 15, 16, 19, 23, 26, 27, 28, 31, 32, 33, 36, 38, 39, 40, 45, 46, 52, 56, 57, 58, 59, 60, 61, 62, 65, 67	FRANIĆ (1910), LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
124.	<i>Coenonympha arcania</i> (Linnaeus, 1760)	2, 13, 15, 16, 19, 21, 26, 27, 28, 31, 32, 33, 35, 36, 40, 41, 42, 43, 45, 46, 47, 52, 56, 57, 58, 59, 60, 61, 62, 65, 67, 68, 69	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
125.	<i>Coenonympha glycerion</i> (Borkhausen, 1788)	2, 11, 13, 19, 22, 31, 32, 33, 35, 40, 42, 43, 45, 47, 56, 58, 59, 61, 62, 68	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
126.	<i>Coenonympha pamphilus</i> (Linnaeus, 1758)	6, 13, 15, 19, 31, 38, 39, 40, 41, 42, 43, 45, 46, 52, 54, 55, 56, 57, 58, 59, 60, 61, 62, 65, 67, 68, 69, 71	LORKOVIĆ (2009), MLADINOV (1973), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
127.	<i>Coenonympha rhodopensis</i> Elwes, 1900	32, 33, 47, 61, 62, 64	KOREN <i>et al.</i> (2015)
128.	<i>Lasiommata maera</i> (Linnaeus, 1758)	15, 19, 21, 26, 31, 32, 33, 47, 57, 58, 59, 61, 65	LORKOVIĆ (2009), MLADINOV (1973), KOREN <i>et al.</i> (2015)
129.	<i>Lasiommata megera</i> (Linnaeus, 1767)	8, 13, 15, 16, 30, 35, 38, 39, 40, 43, 47, 54, 55, 56, 58, 59, 61, 62, 65	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)

130.	<i>Pararge aegeria</i> (Linnaeus, 1758)	9, 16, 19, 27, 39, 58	LORKOVIĆ (2009), KOREN <i>et al.</i> (2011)
131.	<i>Erebia aethiops</i> (Esper, 1777)	7, 9	
132.	<i>Erebia ligea</i> (Linnaeus, 1758)	5, 16, 19, 21, 22, 26, 28, 31, 65	KOČA (1901), LORKOVIĆ (2009), MLADINOV (1973)
133.	<i>Erebia medusa</i> ([Denis & Schiffermüller], 1775)	10, 13, 15, 19, 31, 32, 33, 39, 40, 46, 47, 56, 59, 60, 61, 62, 64	LORKOVIĆ (2009), LORKOVIĆ (2009), LORKOVIĆ (2009), KOREN <i>et al.</i> (2015)
134.	<i>Erebia melas</i> (Herbst, 1796)	8, 16, 23, 27	LORKOVIĆ (2009)
135.	<i>Erebia oeme</i> (Hübner, [1804])	19, 26, 28, 32, 33, 47, 61	LORKOVIĆ (2009)
136.	<i>Proterebia phegea</i> (Borkhausen, 1788)		KOREN <i>et al.</i> (2010), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
137.	<i>Aphantopus hyperantus</i> (Linnaeus, 1758)	9	
138.	<i>Hyponephele lupinus</i> (Costa, 1836)	58	
139.	<i>Hyponephele lycaon</i> (Kühn, 1774)	58	LORKOVIĆ (2009), KOREN <i>et al.</i> (2015)
140.	<i>Maniola jurtina</i> (Linnaeus, 1758)	1, 2, 3, 6, 8, 9, 11, 13, 14, 15, 16, 19, 21, 23, 24, 26, 27, 28, 31, 33, 36, 38, 40, 41, 42, 43, 45, 46, 47, 48, 54, 55, 56, 57, 58, 59, 60, 61, 62, 65, 66, 67, 68, 69, 71	FRANIĆ (1910), LORKOVIĆ (2009), MLADINOV (1973), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
141.	<i>Pyronia tithonus</i> (Linnaeus, 1767)	54, 58	KOREN <i>et al.</i> (2011)
142.	<i>Melanargia galathea</i> (Linnaeus, 1758)	1, 2, 3, 8, 9, 11, 13, 14, 15, 16, 19, 21, 23, 24, 26, 27, 28, 31, 34, 36, 38, 40, 41, 42, 43, 45, 46, 47, 48, 53, 55, 56, 57, 58, 59, 61, 62, 65, 67, 68, 69, 71	LORKOVIĆ (2009), MLADINOV (1973), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
143.	<i>Melanargia larissa</i> (Geyer, [1828])		KOREN <i>et al.</i> (2015)
144.	<i>Arethusana arethusa</i> ([Denis & Schiffermüller], 1775)	6, 15, 46, 47, 54, 58, 59, 61, 65	FRANIĆ (1910), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
145.	<i>Brintesia circe</i> (Fabricius, 1775)	1, 11, 15, 16, 27, 41, 42, 46, 47, 54, 55, 58, 59, 61, 65	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
146.	<i>Chazara briseis</i> (Linnaeus, 1764)	6, 8, 15, 42, 43, 46, 47, 55, 58, 59, 61, 65	KOREN <i>et al.</i> (2011)
147.	<i>Hipparchia fagi</i> (Scopoli, 1763)	15, 41, 43, 58	KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015)
148.	<i>Hipparchia syriaca</i> (Staudinger, 1871)	54, 58	KOREN <i>et al.</i> (2011)
149.	<i>Hipparchia semele</i> (Linnaeus, 1758)	13, 15, 19, 26, 33, 35, 40, 41, 43, 46, 47, 56, 57, 58, 59, 61, 62, 63, 65, 67, 68, 69, 70, 71	LORKOVIĆ (2009), MLADINOV (1973), KOREN <i>et al.</i> (2011), KOREN <i>et al.</i> (2015);
150.	<i>Hipparchia statilinus</i> (Hufnagel, 1766)		LORKOVIĆ (1974), KOREN <i>et al.</i> (2011)
151.	<i>Minois dryas</i> (Scopoli, 1763)	1, 7	
152.	<i>Satyrus ferula</i> (Fabricius, 1793)	40, 42, 43, 45, 46, 58, 59, 61, 65	KOREN <i>et al.</i> (2015)

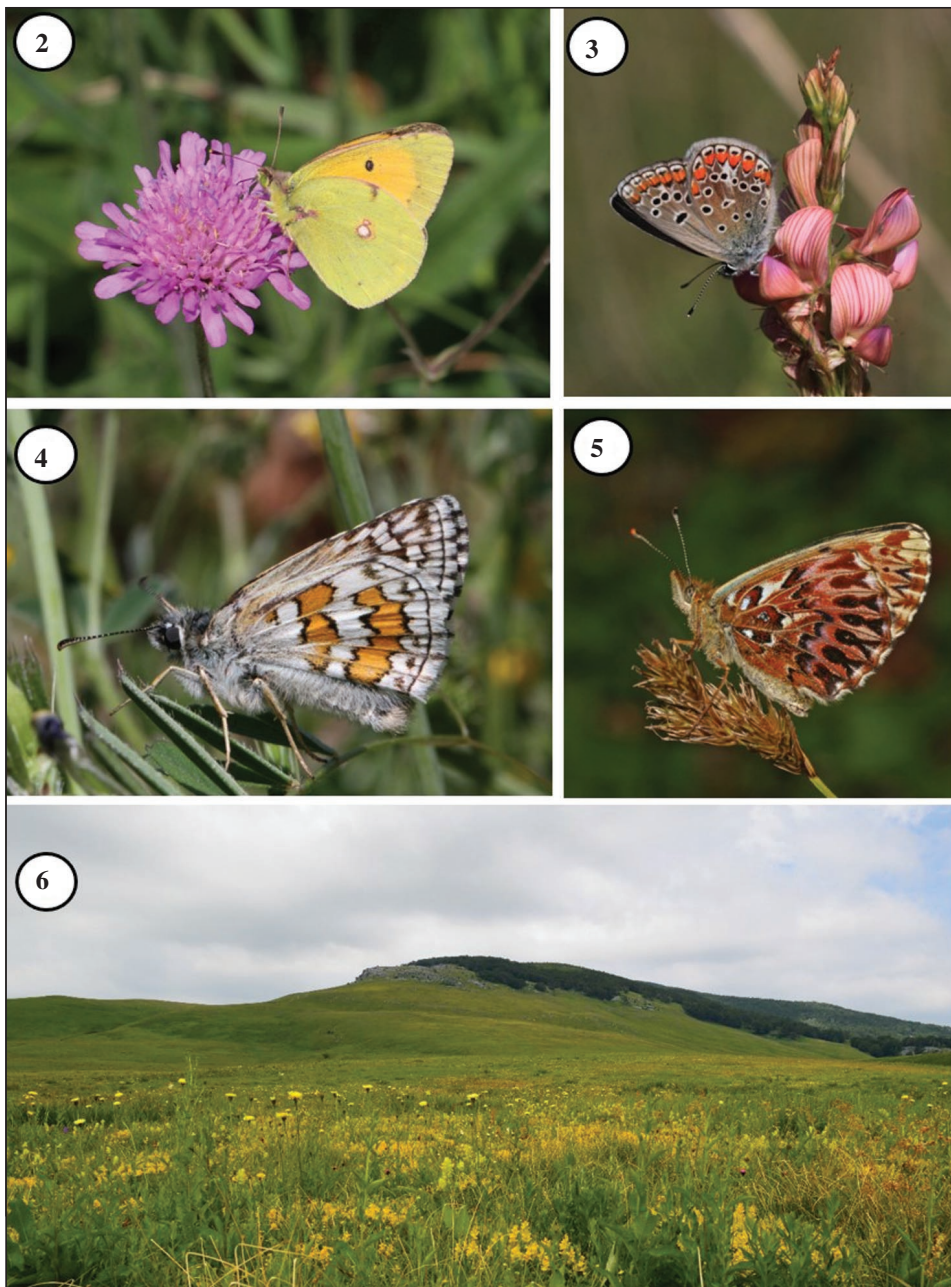
Table II.– Comparisson of the butterfly diversity on three Croatian mountain chains, Velebit, Dinara and Lička Plješevica. Biogeographical affiliation of species is in line with KUDRNA *et al.* (2016).

	List of species	Lička Plješevica	Velebit	Dinara	Biogeographical affiliation*
1.	<i>Hesperia comma</i> (Linnaeus, 1758)	1	1	1	HOL
2.	<i>Ochlodes sylvanus</i> (Esper, 1777)	1	1	1	ES
3.	<i>Thymelicus acteon</i> (Rottemburg, 1775)	1	1	1	EO
4.	<i>Thymelicus lineola</i> (Ochsenheimer, 1808)	1	1	1	HOL
5.	<i>Thymelicus sylvestris</i> (Poda, 1761)	1	1	1	EO
6.	<i>Carterocephalus palaemon</i> (Pallas, 1771)	1	1		HOL
7.	<i>Heteropterus morpheus</i> (Pallas, 1771)	1			ES
8.	<i>Carcharodus alceae</i> (Esper, 1780)	1	1	1	MED
9.	<i>Carcharodus floccifera</i> (Zeller, 1847)	1	1	1	EO
10.	<i>Carcharodus lavatherae</i> (Esper, 1783)	1	1		EM
11.	<i>Erynnis tages</i> (Linnaeus, 1758)	1	1	1	ES
12.	<i>Pyrgus alveus</i> (Hübner, [1803])	1	1	1	ES
13.	<i>Pyrgus armoricanus</i> (Oberthür, 1910)	1	1	1	EO
14.	<i>Pyrgus carthami</i> (Hübner, [1813])	1	1		EO
15.	<i>Pyrgus malvae</i> (Linnaeus, 1758)	1	1	1	ES
16.	<i>Pyrgus serratalae</i> (Rambur, 1839)	1	1	1	ES
17.	<i>Pyrgus sidae</i> (Esper, 1784)	1		1	EO
18.	<i>Spialia orbifer</i> (Hübner, [1823])	1	1	1	EO
19.	<i>Spialia sertorius</i> (Hoffmansegg, 1804)	1			EM
20.	<i>Gegenes pumilio</i> (Hoffmansegg, 1804)		1		EO
21.	<i>Iphiclides podalirius</i> (Linnaeus, 1758)	1	1	1	ES
22.	<i>Papilio machaon</i> Linnaeus, 1758	1	1	1	ES
23.	<i>Zerynthia polyxena</i> ([Denis & Schiffermüller], 1775)	1	1	1	EO
24.	<i>Parnassius apollo</i> (Linnaeus, 1758)	1	1	1	ES
25.	<i>Parnassius mnemosyne</i> (Linnaeus, 1758)	1	1	1	EO
26.	<i>Colias alfacariensis</i> Ribbe, 1905	1	1	1	EO
27.	<i>Colias caucasica</i> Staudinger, 1871	1		1	MON
28.	<i>Colias crocea</i> (Geoffroy, 1785)	1	1	1	EO
29.	<i>Colias hyale</i> (Linnaeus, 1758)		1		ES
30.	<i>Gonepteryx cleopatra</i> (Linnaeus, 1767)		1		MED
31.	<i>Gonepteryx rhamni</i> (Linnaeus, 1758)	1	1	1	ES
32.	<i>Leptidea sinapis</i> (Linnaeus, 1758)	1	1	1	ES
33.	<i>Anthocharis cardamines</i> (Linnaeus, 1758)	1	1	1	ES
34.	<i>Aporia crataegi</i> (Linnaeus, 1758)	1	1	1	ES
35.	<i>Pieris balcana</i> Lorković, 1969	1	1	1	ES
36.	<i>Pieris napi</i> (Linnaeus, 1758)	1	1	1	ES
37.	<i>Pieris brassicae</i> (Linnaeus, 1758)	1	1	1	ES
38.	<i>Pieris ergane</i> (Geyer, [1828])	1	1	1	EO
39.	<i>Pieris mannii</i> (Mayer, 1851)	1	1	1	EO
40.	<i>Pieris rapae</i> (Linnaeus, 1758)	1	1	1	HOL
41.	<i>Pontia edusa</i> (Fabricius, 1777)	1	1	1	ES
42.	<i>Euchloe ausonia</i> (Hübner, [1804])	1			MED
43.	<i>Hamearis lucina</i> (Linnaeus, 1758)	1	1	1	EM
44.	<i>Lycaena alciphron</i> (Rottemburg, 1775)	1	1	1	EO

45.	<i>Lycaena candens</i> (Herrich-Schäffer, 1844)	1	1	1	MON
46.	<i>Lycaena phleas</i> (Linnaeus, 1760)	1	1	1	HOL
47.	<i>Lycaena thersamon</i> (Esper, 1784)	1	1		EO
48.	<i>Lycaena tityrus</i> (Poda, 1761)	1	1	1	ES
49.	<i>Lycaena virgaureae</i> (Linnaeus, 1758)	1	1	1	ES
50.	<i>Aricia agestis</i> ([Denis & Schiffermüller], 1775)	1	1	1	ES
51.	<i>Aricia anteros</i> (Freyer, 1838)	1	1		MON
52.	<i>Aricia artaxerxes</i> (Fabricius, 1793)	1	1	1	BM
53.	<i>Eumedonia eumedon</i> (Esper, 1780)	1	1	1	ES
54.	<i>Cacyreus marshalli</i> Butler, 1898		1		TRO
55.	<i>Celastrina argiolus</i> (Linnaeus, 1758)	1	1	1	ES
56.	<i>Cupido minimus</i> (Fuessly, 1775)	1	1	1	EO
57.	<i>Cupido osiris</i> (Meigen, 1829)	1		1	ES
58.	<i>Cupido alcetas</i> (Hoffmansegg, 1804)		1		ES
59.	<i>Cupido argiades</i> (Pallas, 1771)	1			HOL
60.	<i>Cyaniris semiargus</i> (Rottemburg, 1775)	1	1	1	ES
61.	<i>Glaucopsyche alexis</i> (Poda, 1761)	1	1	1	ES
62.	<i>Iolana iolas</i> (Ochsenheimer, 1816)	1	1	1	EO
63.	<i>Lampides boeticus</i> (Linnaeus, 1767)		1		TRO
64.	<i>Leptotes pirithous</i> (Linnaeus, 1767)	1	1	1	TRO
65.	<i>Phengaris alcon</i> ([Denis & Schiffermüller], 1775)	1	1	1	ES
66.	<i>Phengaris arion</i> (Linnaeus, 1758)	1	1	1	ES
67.	<i>Plebejus argus</i> (Linnaeus, 1758)	1	1	1	ES
68.	<i>Plebejus argyrognomon</i> (Bergsträsser, 1779)	1	1	1	ES
69.	<i>Plebejus idas</i> (Linnaeus, 1761)	1	1		HOL
70.	<i>Lysandra bellargus</i> (Rottemburg, 1775)	1	1	1	EO
71.	<i>Lysandra coridon</i> (Poda, 1761)	1	1	1	EO
72.	<i>Polyommatus admetus</i> (Esper, 1783)	1		1	EO
73.	<i>Polyommatus damon</i> ([Denis & Schiffermüller], 1775)	1		1	ES
74.	<i>Polyommatus ripartii</i> (Freyer, 1830)	1		1	EO
75.	<i>Polyommatus daphnis</i> ([Denis & Schiffermüller], 1775)	1	1	1	EO
76.	<i>Polyommatus amandus</i> (Schneider, 1792)	1	1	1	ES
77.	<i>Polyommatus dorylas</i> ([Denis & Schiffermüller], 1775)	1	1	1	EO
78.	<i>Polyommatus eros</i> (Ochsenheimer, 1808)		1	1	ES
79.	<i>Polyommatus escheri</i> (Hübner, [1823])	1	1	1	EM
80.	<i>Polyommatus icarus</i> (Rottemburg, 1775)	1	1	1	ES
81.	<i>Polyommatus thersites</i> (Cantener, 1835)	1		1	ES
82.	<i>Pseudophilotes vicrama</i> (Moore, 1865)	1	1	1	EO
83.	<i>Scolitantides orion</i> (Pallas, 1771)	1	1	1	ES
84.	<i>Tarucus balkanicus</i> (Freyer, 1844)		1		EO
85.	<i>Callophrys rubi</i> (Linnaeus, 1758)	1	1	1	ES
86.	<i>Satyrium acaciae</i> (Fabricius, 1787)	1		1	EO
87.	<i>Satyrium ilicis</i> (Esper, 1779)	1	1	1	EO
88.	<i>Satyrium pruni</i> (Linnaeus, 1758)		1		ES
89.	<i>Satyrium spini</i> ([Denis & Schiffermüller], 1775)	1	1	1	EO
90.	<i>Satyrium w-album</i> (Knoch, 1782)	1	1		ES
91.	<i>Favonius quercus</i> (Linnaeus, 1758)	1	1	1	EO
92.	<i>Thecla betulae</i> (Linnaeus, 1758)	1	1		ES
93.	<i>Apatura ilia</i> ([Denis & Schiffermüller], 1775)	1			ES

94.	<i>Apatura iris</i> (Linnaeus, 1758)	1	1		ES
95.	<i>Charaxes jasius</i> (Linnaeus, 1767)		1		TRO
96.	<i>Argynnis paphia</i> (Linnaeus, 1758)	1	1	1	ES
97.	<i>Argynnis pandora</i> ([Denis & Schiffermüller], 1775)	1	1	1	EO
98.	<i>Fabriciana adippe</i> ([Denis & Schiffermüller], 1775)	1	1	1	ES
99.	<i>Fabriciana niobe</i> (Linnaeus, 1758)	1	1		ES
100.	<i>Speyeria aglaja</i> (Linnaeus, 1758)	1	1	1	ES
101.	<i>Boloria dia</i> (Linnaeus, 1767)	1	1		ES
102.	<i>Boloria euphrosyne</i> (Linnaeus, 1758)	1	1	1	ES
103.	<i>Boloria selene</i> ([Denis & Schiffermüller], 1775)	1			HOL
104.	<i>Boloria titania</i> (Esper, 1793)	1			HOL
105.	<i>Brenthis daphne</i> (Bergsträsser, 1780)	1	1	1	ES
116.	<i>Brenthis hecate</i> ([Denis & Schiffermüller], 1775)	1	1	1	ES
107.	<i>Brenthis ino</i> (Rottemburg, 1775)	1	1		ES
108.	<i>Issoria lathonia</i> (Linnaeus, 1758)	1	1	1	ES
109.	<i>Libythea celtis</i> (Laicharting, 1782)	1	1	1	EO
110.	<i>Limenitis camilla</i> (Linnaeus, 1764)	1	1		ES
111.	<i>Limenitis populi</i> (Linnaeus, 1758)	1	1		ES
112.	<i>Limenitis reducta</i> Staudinger, 1901	1	1	1	EO
113.	<i>Neptis rivularis</i> (Scopoli, 1763)	1	1	1	ES
114.	<i>Neptis sappho</i> (Pallas, 1771)		1		ES
115.	<i>Euphydryas aurinia</i> (Rottemburg, 1775)	1	1	1	ES
116.	<i>Euphydryas maturna</i> (Linnaeus, 1758)	1			ES
117.	<i>Melitaea athalia</i> (Rottemburg, 1775)	1	1	1	ES
118.	<i>Melitaea aurelia</i> Nickerl, 1850	1	1		EO
119.	<i>Melitaea britomartis</i> Assmann, 1847	1	1	1	ES
120.	<i>Melitaea cinxia</i> (Linnaeus, 1758)	1	1	1	ES
121.	<i>Melitaea diamina</i> (Lang, 1789)	1	1	1	ES
122.	<i>Melitaea didyma</i> (Esper, 1778)	1	1	1	ES
123.	<i>Melitaea phoebe</i> ([Denis & Schiffermüller], 1775)	1	1	1	ES
124.	<i>Melitaea ornata</i> Christoph, 1893	1			ES
125.	<i>Melitaea trivia</i> ([Denis & Schiffermüller], 1775)	1	1	1	EO
126.	<i>Aglais io</i> (Linnaeus, 1758)	1	1	1	ES
127.	<i>Aglais urticae</i> (Linnaeus, 1758)	1	1	1	ES
128.	<i>Araschnia levana</i> (Linnaeus, 1758)	1	1		ES
129.	<i>Nymphalis antiopa</i> (Linnaeus, 1758)	1	1	1	HOL
130.	<i>Nymphalis polychloros</i> (Linnaeus, 1758)	1	1	1	EO
131.	<i>Nymphalis vaualbum</i> ([Denis & Schiffermüller], 1775)	1	1		ES
132.	<i>Polygonia c-album</i> (Linnaeus, 1758)	1	1	1	ES
133.	<i>Polygonia egea</i> (Cramer, 1775)		1		EO
134.	<i>Vanessa atalanta</i> (Linnaeus, 1758)	1	1	1	HOL
135.	<i>Vanessa cardui</i> (Linnaeus, 1758)	1	1	1	COS
136.	<i>Coenonympha arcania</i> (Linnaeus, 1760)	1	1	1	EM
137.	<i>Coenonympha glycerion</i> (Borkhausen, 1788)	1	1	1	ES
138.	<i>Coenonympha pamphilus</i> (Linnaeus, 1758)	1	1	1	EO
139.	<i>Coenonympha rhodopensis</i> Elwes, 1900	1	1	1	MED
140.	<i>Lasiommata maera</i> (Linnaeus, 1758)	1	1	1	ES
141.	<i>Lasiommata megera</i> (Linnaeus, 1767)	1	1	1	EO
142.	<i>Pararge aegeria</i> (Linnaeus, 1758)	1	1	1	EO

143.	<i>Erebia aethiops</i> (Esper, 1777)	1	1	1	EO
144.	<i>Erebia epiphron</i> (Knoch, 1783)		1		MON
145.	<i>Erebia euryale</i> (Esper, 1805)		1	1	MON
146.	<i>Erebia gorge</i> (Hübner, [1804])		1		MON
147.	<i>Erebia ligea</i> (Linnaeus, 1758)	1	1	1	ES
148.	<i>Erebia medusa</i> ([Denis & Schiffermüller], 1775)	1	1	1	ES
149.	<i>Erebia melas</i> (Herbst, 1796)	1	1	1	MON
150.	<i>Erebia oeme</i> (Hübner, [1804])	1	1	1	MON
151.	<i>Erebia ottomana</i> Herrich-Schäffer, 1847		1	1	MON
152.	<i>Erebia pronoe</i> (Esper, 1780)		1		MON
153.	<i>Erebia stiria</i> (Godart, 1824)		1		MON
154.	<i>Erebia triarius</i> (Prunner, 1798)			1	MON
155.	<i>Proterebia phegea</i> (Borkhausen, 1788)	1	1	1	EO
156.	<i>Aphantopus hyperantus</i> (Linnaeus, 1758)	1	1		ES
157.	<i>Hyponephele lupinus</i> (Costa, 1836)	1	1	1	ES
158.	<i>Hyponephele lycaon</i> (Kühn, 1774)	1	1	1	ES
159.	<i>Maniola jurtina</i> (Linnaeus, 1758)	1	1	1	ES
160.	<i>Pyronia tithonus</i> (Linnaeus, 1771)	1	1	1	EM
161.	<i>Melanargia galathea</i> (Linnaeus, 1758)	1	1	1	EO
162.	<i>Melanargia larissa</i> (Geyer, [1828])	1	1	1	EO
163.	<i>Arethusana arethusa</i> ([Denis & Schiffermüller], 1775)	1	1	1	EO
164.	<i>Brintesia circe</i> (Fabricius, 1775)	1	1	1	EO
165.	<i>Chazara briseis</i> (Linnaeus, 1764)	1	1	1	ES
166.	<i>Hipparchia fagi</i> (Scopoli, 1763)	1	1	1	EM
167.	<i>Hipparchia syriaca</i> (Staudinger, 1871)	1	1	1	EO
168.	<i>Hipparchia statilinus</i> (Hufnagel, 1766)	1	1	1	EM
169.	<i>Hipparchia semele</i> (Linnaeus, 1758)	1	1	1	EM
170.	<i>Minois dryas</i> (Scopoli, 1763)	1	1		ES
171.	<i>Satyrus ferula</i> (Fabricius, 1793)	1	1	1	EO
	Total number of species:	152	153	128	
*ES - Euro-Siberian, EO - Euro-Oriental, Mon - Montane, Hol - Holarctic, EM - Euro-Meridional, BM - Boreo-Montane, MED - Mediterranean, TRO - Tropical, COS - Cosmopolitan.					



Figures 2-6.– 2. *Colias caucasica* was observed only once at Mt. Poštak. 3. *Polyommatus thersites* was locally common where sainfoins grow. 4. *Pyrgus sidae* is a rare species in Croatia. 5. *Boloria titania* was recorded at Badovinac almost 100 years ago. 6. Preserved and butterfly rich Čemernica meadows near Gornja Suvaja